a first detector that detects initial contact of the material with the substrate, said detection being dependent on an optimum illumination intensity reflected from the substrate and received at the first detector; and

a controller that adjusts the light source to produce said optimum reflected illumination received at the first detector.

A2 cont'd

8. (New) An arrangement as claimed in claim 7, wherein said controller further includes a second detector that detects the illumination intensity reflected from the substrate.

REMARKS

This application has been reviewed in light of the Office Action dated December 19, 2002. Claims 1-8 are pending in the case. No new matter has been added by the amendments.

By the Office Action, Claims 1-6 are rejected under 35 U.S. C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 2 have been amended in a way believed to overcome the rejection. Reconsideration of the rejections is respectfully requested.

By the Office Action, claims 1 and 2 stand rejected under 35 U.S.C. §102(e) as being anticipated by Subramanian (U.S. Patent No. 6,248,175 B1). The Examiner stated that Subramanian discloses means for illuminating the substrate (item 68), in the form of a light source, two state means for adjusting the illuminating by turning 68 on and off (item 66), and means for controlling the dispensing of material as a function of the adjusted illumination (item 74 – See Figure 3 for entire system) in the form of a controller coupled to the light source.

Applicant respectfully traverses the rejection. Subramanian fails to disclose or suggest means for illuminating the substrate, means for adjusting the illumination on the substrate to determine a reflectivity of the substrate, and means for controlling the dispensing of material as a function of the adjusted illumination.

The system in Subramanian starts by applying a predetermined volume of developer material onto a photoresist material layer using a two position offset movement system. Subramanian further provides for a measurement system to measure the thickness uniformity of the developed photoresist material layer disposed on a test wafer. The thickness measurement system consists of a light source connected by a fiber optic line to a light driver. The light driver is turned on and off for thickness measurements of the photoresist material layer by a processor. The light source sends a ray of light at the resist layer, which is reflected as a ray of light to a light receiver which is coupled to the measurement system for making resist thickness measurements. The processor receives the measured data from the measuring system and determines the overall thickness and the thickness uniformity of the developed photoresist material layer.

Subramanian does not disclose or suggest measuring reflectivity and instead merely uses an interferometer to measure thickness of an applied photoresist layer. In addition, the light source of Subramanian is turned on to do the test and off when the thickness is not being measured. There is no disclosure or suggestion that the light source is in any way adjusted to optimize a reflectivity measurement of the substrate. In fact, the system of Subramanian is employed for the addition of a uniform amount of developer rather than photoresist material (see, e.g. Abstract of Subramanian).

Claim 1 includes, *inter alia*, means for illuminating the substrate with a plurality of illumination intensities. As discussed above, Subramanian does not illuminate the substrate, but

rather only illuminates the photoresist material layer to determine the thickness of the photoresist layer (Column 7, Lines 6-8). Furthermore, Subramanian discloses a two state light source, and claim 1, as amended, recites a plurality of illumination intensities to further distinguish over Subramanian. Since Subramanian does not illuminate the substrate, as established above, it also does not disclose " means for adjusting illumination intensities on the substrate". Additionally, Subramanian does not disclose means for controlling the dispensing of material as a function of the adjusted illumination over a plurality of illumination intensities, as Subramanian has only a two state light source.

Claim 2 recites "a controller...adapted to adjust the illumination on the substrate based on the reflectivity of the substrate". Claim 2 clearly distinguishes over Subramanian since Subramanian does not adjust the illumination of the substrate based on the reflectivity of light from the substrate in accordance with feedback from a sensor or photodiode. Rather, as established above, Subramanian only illuminates the photoresist material and measures the thickness thereof, and is not concerned with the reflectivity of the substrate as a method for feedback for determining an amount of photoresist material. Instead, Subramanian is concerned with the thickness of the photoresist layer so that a uniform amount of developer material can be introduced.

Accordingly for the above reasons, claims 1 and 2 are clearly distinguished over Subramanian. Therefore, for at least the reasons stated Subramanian fails to disclose or suggest the present invention as claimed.

By the Office Action, Claims 3-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Subramanian as applied to claims 1 and 2 above, and further in view of Sanada (U.S. Patent # 5,985,357). Sanada is cited as showing the use of a photodiode as a detector.

Applicant respectfully notes that the Examiner stated that the photodiode (6c) was used to illuminate the substrate, but clearly it is used only as a detector since infrared detector (6b) is used for illumination. Sanada does not cure the deficiencies of Subramanian since Sanada also does not disclose adjustment of the illumination on the substrate or the measurement of reflectivity of the substrate as set forth in claims 1 and 2 and described in detail above. Since neither Sanada nor Subramanian disclose or suggest these features, the present invention as recited claims 1 or 2 are believed to be allowable. Dependent claims 3-6 are therefore believed to be allowable for at least their dependency from claims 1 and 2. Reconsideration of the rejection is earnestly solicited.

In view of the foregoing amendments and remarks, it is respectfully submitted that all the claims now pending in the application are in condition for allowance. Early and favorable reconsideration of the case is respectfully requested.

Respectfully submitted,

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MARKED-UP VERSION FOR THE CLAIMS

1. (Amended) An arrangement for forming a layer over a semiconductor substrate, comprising:

means for illuminating the substrate with a plurality of illumination intensities;

means for adjusting the illumination intensities on the substrate to determine a reflectivity of the substrate; and

means for controlling [the dispensation] dispensing of a material over the substrate as a function of the adjusted illumination.

2. (Amended) An arrangement for forming a layer over a semiconductor substrate, comprising:

a light source adapted to illuminate the semiconductor substrate;

a controller coupled to the light source and adapted to adjust the illumination on the substrate based on the reflectivity of the substrate, the controller further adapted to selectively control [the dispensation] dispensing of a material over the substrate as a function of the adjusted illumination.